Original Research

# ESTROGEN AND PROGESTERONE RECEPTOR STATUS IN PRE-MENOPAUSAL AND POST-MENOPAUSAL WOMEN PRESENTING WITH BREAST CANCER

**Noor Ul Ain[1], Shagufta Solangi[2], Nadia Bhatti[3*], Sayed Parvez Ali Shah[4], Mohammad Ali Naper[5], Afshan Bhatti[6]**
[1]General Surgery Department, GIMS Hospital Gambat.
[2,3*,4,5]Department of Surgery, Shaheed Mohtarma Benazir Bhutto Medical University Larkana.
[6]Department of Gynaecology, Shaheed Mohtarma Benazir Bhutto Medical University Larkana.
**Corresponding Author:** Nadia Bhatti
Department of Surgery, Shaheed Mohtarma Benazir Bhutto Medical University Larkana.
**Email**: haarisbilal50@gmail.com

## ABSTRACT

**Objective:** To determine the status of estrogen and the progesterone receptor among pre-menopausal and post-menopausal women with breast cancer

**Background:** Women all around the world are most commonly hit by the malignancy named the "breast cancer". About one fifth of women in the world die due to this as its incidence is continuously increasing. Age, age at menarche, parity, age at menopause are few of the risk factors responsible. Age and menopause are the two factors which affects the overall influence the ER/ PR status. Because of clear evidence that investigation of the estrogen receptor (ER) expression reveals clue for the biologic and prognostic progression of disease.

**Materials And Methods:** A cross sectional study was conducted at **s**urgical Unit-III, Chandka Medical College Hospital, Larkana, using tissue sample biopsy 120 patients were evaluated to determine the estrogen receptor (ER) status. Statistical package for social sciences (SPSS) version 25 was used to enter and analyze the data.

**Results:** In this study, the postmenopausal women were 87 (72.5%) while premenopausal were 33 (27.5%) in this study Main outcome of the study was ER/PR status which was found that among postmenopausal women ER and PR were positive in 77% (n =67) & 79.3% (n = 69) respectively while among premenopausal women ER and PR were positive in 97% (n =32) & 69.7% (n = 23) respectively

**Conclusion:** The results show that nearly three fourths of all breast cancer affected patients had an ER and PR were positive- while majority of these were postmenopausal women. Education & awareness, screening & early detection and proper and quick treatment response to ER/PR positive and all other subtypes of breast cancer are the key to better prognosis.

**Keywords:** Breast Cancer, Estrogen Progesterone Receptors, Postmenopause.

## INTRODUCTION

Women all around the world are most commonly hit by the malignancy named the "breast cancer". About one fifth of women in the world die due to this as its incidence is continuously increasing [1]. Age, age at menarche, parity, age at menopause are few of the risk factors responsible [2, 3, 6]. More than two centuries have passed since the breast cancer has been identified and it was treated by removing the ovaries of affected women. Though; it was associated with increase in life of patients, but the relative mechanism had not been understood for improved survival. Some thought it is a nervous connection of ovaries with the breast tissues [4, 5, 8], but later on, estrogen and progesterone receptors -presented in the breast-were evidenced to be the ultimately responsible to ligand-receptor pathway. Age and menopause are the two factors which affects the overall influence the ER/ PR status [10] of such hormone dependant tumours. Studies have found strong correlation between the ER positive rate and the age, histological differentiation, tumor size, and menopause status [9-11]. American Society of Clinical Oncology suggests which is further endorsed by another institute i-e; College of American Pathologists that all the new cases of invasive breast cancer should be tested for diagnosis of breast cancer [12], because of clear evidence that investigation of the estrogen receptor (ER) expression reveals clue for the biologic and prognostic progression of disease [13]

Study by Rajan G, et al., found that 47.4% postmenopausal and 56.1% premenopausal women having breast cancer and these women had status of ER positive and 34.7% postmenopausal and 47.7% premenopausal women were PR positive [14]. Very

*www.ajmrhs.com*
eISSN: 2583-7761

Date of Received: 21-01-2026
Date Acceptance: 01-02-2026
Date of Publication: 02-03-2026

different from these statistics, a study by Petricevic J, et al. reported that Estrogen receptors were present in 73.9% & 66.7% postmenopausal and premenopausal women respectively and Progesterone receptors were present in 70.4% & 69.6% premenopausal and postmenopausal with breast cancer respectively [15].

The worldwide practice of assessing the status of E receptors & P receptors for breast cancer is common. Based on the available international data on the ER and PR status and its relationship with the breast cancer and lacking of local data on this very serious issue of women health, there is need for assessment of local population of before and after menopause presenting with breast cancer for ER/ PR expression. The results of the current study discuss the clinical use of ER as a predictive biomarker in order to identify correctly doubted patients of breast cancer.

## MATERIAL AND METHODS

A cross sectional study was conducted at **s**urgical Unit-III, Chandka Medical College Hospital, Larkana for a period of six months from 01-07-2018 to 31-12-2018. One hundred and twenty study subjects were included in the study using non probability purposive sampling technique. Married/ widowed woman diagnosed case of breast cancer aging from 35 to 75 were part of the study.

Patients included in the study went through evaluation of ER and PR status, to determine the estrogen receptor (ER) status we used the tissue sample biopsy.

Statistical package for social sciences (SPSS) version 25 was used to enter and analyze the data. Descriptive analysis was done using mean & standard deviation (Mean ± SD), While categorical variables were analyzed using proportions and percentages. Approval for the study was obtained from ethical review committee of the SMBBMU Larkana. All the patients who agreed to participate were asked to complete informed consent forms. The respondents were assured for the privacy of their answers.

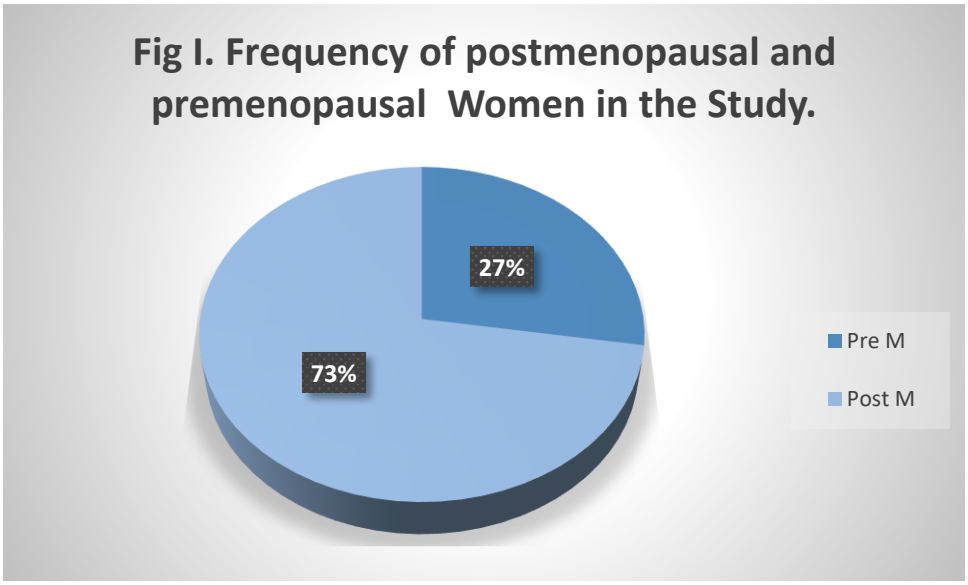
## RESULTS

In postmenopausal women the mean ± SD age was 63.29 ± 8.27 years. The mean ± SD age while it was 44.61 ± 3.78 years in premenopausal women. The age of menarche was 13.02 ± 1.15 & 13.94 ± 1.17 years in the postmenopausal & premenopausal women respectively. The duration of marriage which was 43.69 ± 8.92 & 24.39 ± 3.88 years respectively in the two groups. Mean and standard deviation of variables like parity, number of children, number of abortions, age at menopause, height, weight, BMI, & duration of oral contraceptive use are detailed in table I.

Table I. Baseline Descriptive Data of all Women in Both Groups

| Variable | Group | Min | Max | Mean | S D |
|---|---|---|---|---|---|
| Age (years) | Post-M | 40 | 75 | 63.29 | 8.27 |
| | Pre-M | 39 | 51 | 44.61 | 3.78 |
| Age at menarche | Post-M | 11 | 16 | 13.02 | 1.15 |
| | Pre-M | 12 | 16 | 13.94 | 1.17 |
| Marriage duration | Post-M | 20 | 58 | 43.69 | 8.92 |
| | Pre-M | 19 | 31 | 24.39 | 3.88 |
| Parity | Post-M | 1 | 12 | 4.6 | 2.52 |
| | Pre-M | 1 | 9 | 4.64 | 2.01 |
| Live births | Post-M | 1 | 12 | 4.83 | 2.54 |
| | Pre-M | 2 | 10 | 5.03 | 2.2 |
| Abortions | Post-M | 0 | 2 | 0.24 | 0.59 |
| | Pre-M | 0 | 2 | 0.33 | 0.69 |
| Age of menopause | Post-M | 39 | 51 | 44.98 | 3.35 |
| | Pre-M | | | | |
| Weight (Kgs) | Post-M | 52 | 98 | 70.94 | 9.43 |
| | Pre-M | 54 | 81 | 67.39 | 8.7 |
| Height ($m^2$) | Post-M | 2.23 | 3.39 | 2.92 | 0.25 |
| | Pre-M | 2.23 | 3.31 | 2.9 | 0.25 |
| BMI | Post-M | 17.88 | 34.16 | 24.45 | 3.6 |
| | Pre-M | 17.88 | 28.74 | 22.73 | 3.38 |
| Duration of oral contraceptives use (Years) | Post-M | 0 | 12 | 2.78 | 3.56 |
| | Pre-M | 0 | 12 | 3.67 | 3.77 |

In this study, the postmenopausal women were 87 (72.5%) while premenopausal were 33 (27.5%) in this study. Fig I




Main outcome of the study was ER/PR status which was found that among postmenopausal women ER and PR were positive in 77% (n =67) & 79.3% (n = 69) respectively while among premenopausal women ER and PR were positive in 97% (n =32) & 69.7% (n = 23) respectively. Table II

A step ahead it was noted that detection of both of ER was 67 in post Menopause and 32 in premenopausal, while PR was positive in 69 and 23 women in post menopause and premenopausal respectively. Much of premenopausal group women 60.6% (n = 20) had history of using contraceptives while 48.3% (n = 42) postmenopausal women had had used contraceptives. The Breast cancer history in family was found more positively among postmenopausal women 69% (n = 60) than the premenopausal women. Table II

Table II. Frequency Distribution of categorical variables in the Study

| Study Variable | Group | Frequency | Percent |
|---|---|---|---|
| Status of Subjects | Post M | 87 | 72.5 |
| | Pre M | 33 | 27.5 |
| ER status Positive | Post-M | 67 | 77 |
| | Pre-M | 32 | 97 |
| PR status Positive | Post-M | 69 | 79.3 |
| | Pre-M | 23 | 69.7 |
| Urban | Post-M | 50 | 41.67 |
| | Pre-M | 17 | 14.17 |
| Rural | Post-M | 37 | 30.83 |
| | Pre-M | 16 | 13.33 |
| Positive family history of breast cancer | Post-M | 60 | 69 |
| | Pre-M | 21 | 63.6 |
| Contraceptive Use | Post-M | 42 | 48.3 |
| | Pre-M | 20 | 60.6 |

The Chi square test of association is detailed in table III reveals the association between ER/PR status and variables in the study. Stratified analysis revealed non-significantly that frequency of ER/PR detection increased with increasing age among both postmenopausal and premenopausal women - however it was worth noting that rise of frequency was much rapid in premenopausal women. (P value = 0.532 & 0.850 respectively. Rural living women of either group (postmenopausal or premenopausal) women had lesser frequency of ER/PR positive

detection compared to urban living (P value = 0.316 & 0.246 respectively. The family history of breast cancer appeared to be the only finding in the study to have significant association with detection of ER /PR. Table III

Table III. Chi Square Association of Various Factors with Status of ER/PR

| Study Variable | | | Er/Pr Detected | | Total | P Value |
|---|---|---|---|---|---|---|
| | | | Yes | No | | |
| Family History of Breast cancer | Yes | Post M | 37 | 23 | 60 | 0.599 |
| | | | 61.70% | 38.30% | 100.00% | |
| | | Pre M | 13 | 8 | 21 | |
| | | | 61.90% | 38.10% | 100.00% | |
| | | | 13 | 14 | 27 | 0.041 |
| | | | 48.10% | 51.90% | 100.00% | |
| | | Pre M | 10 | 2 | 12 | |
| | | | 83.30% | 16.70% | 100.00% | |
| Menarche age | Up to 12 y | Post M | 23 | 10 | 33 | 0.266 |
| | | | 69.70% | 30.30% | 100.00% | |
| | | No | **Post M** | 0 | 4 | |
| | | | 100.00% | 0.00% | 100.00% | |
| | 13-14 y | Post M | 22 | 23 | 45 | 0.094 |
| | | | 48.90% | 51.10% | 100.00% | |
| | | Pre M | 14 | 6 | 20 | |
| | | | 70.00% | 30.00% | 100.00% | |
| | ≥15 y | Post M | 5 | 4 | 9 | 0.681 |
| | | | 55.60% | 44.40% | 100.00% | |
| | | Pre M | 5 | 4 | 9 | |
| | | | 55.60% | 44.40% | 100.00% | |
| Age category | 35-45 | Post M | 2 | 2 | 4 | 0.532 |
| | | | 50% | 50% | 100% | |
| | | Pre M | 13 | 8 | 21 | |
| | | | 61.90% | 38.10% | 100% | |
| | 46-55 | Post M | 5 | 4 | 9 | 0.85 |
| | | | 55.60% | 44.40% | 100.00% | |
| | | Pre M | 10 | 2 | 12 | |
| | | | 83.30% | 16.70% | 100.00% | |
| Menarche age | Up to 12 years | Post M | 23 | 10 | 33 | 0.266 |
| | | | 69.70% | 30.30% | 100.00% | |
| | | Pre M | 4 | 0 | 4 | |
| | | | 100.00% | 0.00% | 100.00% | |
| | 13-14 years | Pre M | 14 | 23 | 45 | 0.094 |
| | | | 70.00% | 51.10% | 100.00% | |
| | | | | 6 | 20 | |
| | | | | 30.00% | 100.00% | |
| | 15 years and above | Post M | 5 | 4 | 9 | 0.681 |
| | | | 55.60% | 44.40% | 100.00% | |
| | | Pre M | 5 | 4 | 9 | |
| | | | 55.60% | 44.40% | 100.00% | |
| BMI | Underweight | Post M | 3 | 3 | 6 | 0.455 |
| | | | 50.00% | 50.00% | 100.00% | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Pre M | 6 | 3 | 9 | |
| | | | 66.70% | 33.30% | 100.00% | |
| | Normal weight | Post M | 29 | 23 | 52 | 0.429 |
| | | | 55.80% | 44.20% | 100.00% | |
| | | Pre M | 10 | 6 | 16 | |
| | | | 62.50% | 37.50% | 100.00% | |
| | Overweight | Post M | 15 | 9 | 24 | 0.193 |
| | | | 62.50% | 37.50% | 100.00% | |
| | | Pre M | 7 | 1 | 8 | |
| | | | 87.50% | 12.50% | 100.00% | |
| Oral Contraceptive Use | Yes | Post M | 23 | 19 | 42 | 0.456 |
| | | | 54.80% | 45.20% | 100.00% | |
| | | Pre M | 12 | 8 | 20 | |
| | | | 60.00% | 40.00% | 100.00% | |
| | No | Post M | 27 | 18 | 45 | 0.091 |
| | | | 60.00% | 40.00% | 100.00% | |
| | | Pre M | 11 | 2 | 13 | |
| | | | 84.60% | 15.40% | 100.00% | |
| Residence | Urban | Post M | 30 | 20 | 50 | 0.316 |
| | | | 60.00% | 40.00% | 100.00% | |
| | | Pre M | 12 | 5 | 17 | |
| | | | 70.60% | 29.40% | 100.00% | |
| | Rural | Post M | 20 | 17 | 37 | 0.246 |
| | | | 54.10% | 45.90% | 100.00% | |
| | | Pre M | 11 | 5 | 16 | |
| | | | 68.80% | 31.20% | 100.00% | |
| No. od Abortions | One abortion | Post M | 46 | 34 | 80 | 0.195 |
| | | | 57.50% | 42.50% | 100.00% | |
| | | Pre M | 20 | 9 | 29 | |
| | | | 69.00% | 31.00% | 100.00% | |
| | Two abortions | Post M | 4 | 3 | 7 | 0.53 |
| | | | 57.10% | 42.90% | 100.00% | |
| | | Pre M | 3 | 1 | 4 | |
| | | | 75.00% | 25.00% | 100.00% | |
| No. Of Children | Up to 2 children | Post M | 8 | 7 | 15 | 0.588 |
| | | | 53.30% | 46.70% | 100.00% | |
| | | Pre M | 2 | 1 | 3 | |
| | | | 66.70% | 33.30% | 100.00% | |
| | 3-5 children | Post M | 27 | 19 | 46 | 0.279 |
| | | | 58.70% | 41.30% | 100.00% | |
| | | Pre M | 14 | 6 | 20 | |
| | | | 70.00% | 30.00% | 100.00% | |
| | 5-10 children | Post M | 13 | 10 | 23 | 0.371 |
| | | | 56.50% | 43.50% | 100.00% | |
| | | Pre M | 7 | 3 | 10 | |
| | | | 70.00% | 30.00% | 100.00% | |

## DISCUSSION

Breast cancer is the number one killer disease of women all over the world. More than twenty percent of deaths in female population are due to malignant breast cancers. The disease affects both the perimenopausal and postmenopausal women, and it is rarely found in women of age younger age i-e; below 25 years [7-11, 17, 21]

Studies and researchers postulate that estrogen is main role player in development of breast cancer as the normal breast tissue contains estrogen (ER) and progesterone (PR) receptors [16, 18, 19, 20]. Family history of breast cancer is women an inverse picture was seen with statistical significance. (P value = 0.599 & 0.041 respectively) .Increasing parity (number of children) (P values = 0.588, 0.279, 0.371, & 0.155 respectively), COC use (P value = 0.456 & 0.091) and rural living (P value = 0.316 & 0.246 respectively) were two protective factors and were associated with lesser frequency of ER/PR positive detection. Study by Russo J, et al., and other few studies have found that pregnancy and parity are two important protective factors [24]. Well defined factor which increasing chances of disease [12, 15, 22, 23, 24] Same was the findings of the current study but with slight variation. It was interesting to note that ER/PR positive detection was on higher side among postmenopausal women in presence of positive family history while in premenopausal.

## CONCLUSION

The results show that nearly three fourths of all breast cancer affected patients had an ER and PR were positive- while majority of these were postmenopausal women. Education & awareness, screening & early detection and proper and quick treatment response to ER/PR positive and all other subtypes of breast cancer are the key to better prognosis.

## REFERENCES


1. Ferlay J, Shin HR, Bray F. Papers of special note have been highlighted as:of interest of considerable interest. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. Int J Cancer. 2010;127:2893–917.
2. Anderson TJ, Ferguson DJ, Rabb GM. Cell turnover in the “resting” human breast:influence of parity, contraceptive pill, age and laterality. Br J Cancer. 1982;46:376-82.
3. Ferguson DJ, Anderson TJ. Morphological evaluation of cell turnover in relation to menstrual cycle in the “resting” human breast. Br J Cancer. 1981;44:177-181.
4. Rhodes A, Jasani B, Balaton AJ. Frequency of oestrogen and progesterone receptor positivity by immunohistochemical analysis in 7016 breast carcinomas:correlation with patient age, assay sensitivity, threshold value, and mammographic screening. J Clin Pathol. 2000;53:688–96.
5. Fisher B, Redmond C, Brown A. Treatment of primary breast cancer with chemotherapy and tamoxifen. N Engl J Med. 1981;305:1–6.
6. Shahani MP, Ahmer A, Siyal FJ, Soomro SH, Humayun A, Shaikh AA, Abbas J, Shahani Z, Saleem R, Unar AA. Breast self-examination: knowledge and practice of young female students towards breast self examination and breast cancer. Journal of Pharmaceutical Research International. 2020 Oct 16;32(24):93-100.
7. Beatson GW. On the treatment of inoperable cases of carcinoma of the mamma:suggestions for a new method of treatment with illustrative cases. Lancet. 1896;148:104–7.
8. Wadho S, Panhwar AD, Gurbakhshani R, Humayun A, Malik E, Safder Z, Shahani MP. SELF-BREAST EXAMINATION PRACTICES AMONG SCHOOL TEACHERS: A CROSS SECTIONAL STUDY.
9. Khalid A, Aman S, Jhatial I, Talreja W, Hussain W, Wadho S, Shahani MP. Factors Affecting Non Compliance with Exclusive Breastfeeding Among Mothers: A Survey at District Hospital Dadu. Pakistan Journal of Medical & Health Sciences. 2023 Mar 25;17(02):380-.
10. Bornstrom L, Sjoberg M. Mechanisms of estrogen receptor signaling:convergence of genomic and nongenomic actions on target genes. Mol Endocrinol. 2005;19:833–42.
11. Dunnwald LK, Rossing MA, Li CI. Hormone receptor status, tumor characteristics, and prognosis:a prospective cohort of breast cancer patients. Breast Cancer Res. 2007;9:R6.
12. Chu KC, Anderson WF. Rates for breast cancer characteristics by estrogen and progesterone receptor status in the major racial/ethnic groups. Breast Cancer Res Treat. 2002;74:199–211.
13. Chlebowski RT, Chen Z, Anderson GL. Ethnicity and breast cancer:factors inflencing differences in incidence and outcome. J Natl Cancer Inst. 2005;97:439–48.
14. Yip CH, Pathy NB, Uiterwaal CS. Factors affecting estrogen receptor status in a multiracial Asian country: an analysis of 3557 cases. Breast. 2011;20(Suppl.):S60–S64.
15. Pujol P, Hilsenbeck SG, Chamness GC, Elledge RM. Rising levels of estrogen receptor in breast cancer over 2 decades. Cancer. 1994;74:1601–06.
16. Soerjomataram I, Louwman MW, Ribot JG. An overview of prognostic factors for long-

term survivors of breast cancer. Breast Cancer Res Treat. 2008;107:309–30.
17. Grann VR, Troxel AB, Zojwalla NJ. Hormone receptor status and survival in a population-based cohort of patients with breast carcinoma. Cancer. 2005;103:2241–51.
18. Chow LW, Ho P. Hormonal receptor determination of 1,052 Chinese breast cancers. J Surg Oncol. 2000;75:172–5.72.
19. Rhodes A, Jasani B. The oestrogen receptornegative/progesterone receptor-positive breast tumour:a biological entity or a technical artefact? J Clin Pathol. 2009;62:95–6.
20. Arnesson LG, Smeds S, Fagerberg G. Recurrence-free survival in patients with small breast cancer. Eur J Surg. 1994;160:271-6.
21. De-Mascarel I, Soubeyran I, MacGrogan G. Immunohistochemical analysis of estrogen receptors in 938 breast carcinomas. Concordance with biochemical assay and prognostic signifince. Appl Immunohistochem. 1995;3:222–31.
22. Kell DL, Kamel OW, Rouse RV. Immunohistochemical analysis of breast carcinoma estrogen and progesterone receptors in paraffi-embedded tissue, correlation of clones ER1D5 and 1A6 with.
23. Allred DC, Bustamante MA, Daniel CO. Immunocytochemical analysis of estrogen receptors in human breast carcinomas. Evaluation of 130 cases and review of the literature regarding concordance with biochemical assay and clinical relevance. Arch Surg. 1990; 125:107–13.
24. Russo J, Moral R, Balogh GA, Mailo D, Russo IH. The protective role of pregnancy in breast cancer. Breast Cancer Res. 2005;7(3):131-42.

**How to cite this article:** Noor Ul Ain, Shagufta Solangi, Nadia Bhatti, Sayed Parvez Ali Shah, Mohammad Ali Naper, Afshan Bhatti, ESTROGEN AND PROGESTERONE RECEPTOR STATUS IN PRE-MENOPAUSAL AND POST-MENOPAUSAL WOMEN PRESENTING WITH BREAST CANCER, Asian J. Med. Res. Health Sci., 2026; 4 (1):397-403.
**Source of Support:** Nil, Conflicts of Interest: None declared.